Testing for asymmetric information in the *viager* market ☆

Philippe Février [a], Laurent Linnemer [a,*], Michael Visser [b]

[a] CREST-LEI, 15 Boulevard Gabriel Péri, 92245 Malakoff, France
[b] ERMES-CNRS and CREST-LEI, 26, rue des Fossés Saint-Jacques, 75005 Paris, France

ARTICLE INFO

ABSTRACT

A *viager* real estate transaction consists in selling a property in return for a down payment and a life annuity that the buyer has to pay until the seller dies. This paper tests for the presence of asymmetric information in this market using notarial data on transactions in Paris between 1993 and 2001. We first derive and test empirically a no arbitrage condition stating that the price of a *viager* has to be equal to its expected returns. Using this condition, we identify the type of the seller as a sum of weighted death probabilities. By comparing these sums with analogously defined national-level sums we find that sellers have on average shorter survival times than persons in the general population. We then develop a model for a *viager* sale and derive testable predictions under symmetric and asymmetric information. Our test for asymmetric information consists in regressing the contract parameters (down payment and annuity) on the inferred type of the seller, and comparing the estimates with the predicted outcomes. The hypothesis that information is symmetrically distributed between buyers and sellers is accepted.

-You are quite sure that you do not want to sell your farm?
-Certainly not…
-Very well; only I think I know of an arrangement that might suit us both very well.
-What is it?
-Just this. You shall sell it to me and keep it all the same. You don't understand? Very well, then follow me in what I am going to say. Every month I will give you a hundred and fifty francs. You will have your own home just as you have now, need not trouble yourself about me, and will owe me nothing; all you will have to do will be to take my money. Will that arrangement suit you?
-It seems all right as far as I am concerned, but I will not give you the farm.
-Never mind about that; you may remain here as long as it pleases God Almighty to let you live; it will be your home. Only you will sign a deed before a lawyer making it over to me, after your death.

You have no children, only nephews and nieces for whom you do not care a straw. Will that suit you?
From *The little Cask*, by Guy de Maupassant (1884).

1. Introduction

In most developed countries the life expectancy of individuals has increased substantially over the last decades. Policy makers have recently responded to these increasing survival times by making publicly provided pension schemes less generous and augmenting the minimum retirement age. Given these trends, it is important to study in which way the elderly finance their retirement. Of particular interest is the question what role alternative and complementary mechanisms may play in alleviating the financial needs of retired people.

One mechanism is the life annuity. This is an insurance product that pays the insured person regular sums of money (annuity payments) for life, in exchange of a premium. Life annuities thus protect the beneficiaries against the risk of outliving their personal resources. As shown in a theoretical literature initiated by Yaari (1965), optimally behaving economic agents should annuitize all or large parts of their wealth. In practice, however, annuity markets are generally thin,[1] so apparently individuals do not annuitize as much as theory predicts. The most natural explanation for this puzzle is the presence

[1] Mitchell et al. (1999) indicate that "the market for individual life annuities in the United States has historically been small"; James and Song (2001) give statistics on the size of annuity markets in Australia, Canada, Chile, Israel, Singapore, Switzerland, and the UK, and state that "annuities markets are still poorly developed in virtually all these countries."

of asymmetric information between insurers and annuitants. Since potential annuitants have private information on their health status and parents' mortality, they are likely to be better informed about their survival prospects than insurers. They may exploit this advantage by deciding whether or not to purchase annuities. Given the insurance premiums, only individuals who are expected to live sufficiently long would purchase an annuity, as they are the ones who, on average, can benefit from it. To compensate for this autoselection, insurers need to increase their premiums, making their product financially uninteresting for yet another subgroup of the population. This process may repeat itself and exclude more and more individuals from the market. In the extreme case the market may completely unravel–like the lemons market described by Akerlof (1970)–until all individuals are driven out of the marketplace except the riskiest annuitants (those with the highest expected survival time). In a series of papers, (Finkelstein and Poterba, 2002, 2004, 2006) have tested for asymmetric information in the UK annuity market. Their findings are consistent with the presence of asymmetric information, which may (partly) explain the limited size of this market.

Another potentially interesting mechanism for older people, at least for those who are homeowners, is a reverse mortgage. This is a relatively new financial product that has been introduced in the USA, Canada, the UK and Singapore (see Chan (2002), for a survey). A reverse mortgage is an arrangement in which homeowners receive a loan against the value of their home.[2] Borrowers may continue living in their property, and the loan plus accrued interest and other charges is repaid when they exit their home or when they die. The lender does not have legal recourse to anything other than the value of the home when the loan has to be reimbursed. If the total sum due at the termination date exceeds the property value then the difference is absorbed by the lender. A reverse mortgage can therefore be financially beneficial for homeowners who anticipate that they will remain a long time in their property (because they have high longevity expectations or plan to move out of their property only in the far future). Davidoff and Welke (2007) argue that lenders may anticipate this adverse selection and charge high fees to their clients, which may in turn explain the smallness of the reverse mortgage market in the USA (less than 1% of homeowners are reverse mortgage borrowers).

This paper studies a mechanism that is closely related to a reverse mortgage. It is a specific type of real estate transaction which exists in several European countries (Belgium, France, Germany, Italy, Spain), and is known in France as *viager*. Homeowners who sell their property via the *viager* method receive in return a down payment from the buyer, and a monthly or yearly annuity until the end of their life. Like reverse mortgage borrowers, *viager* sellers are allowed to remain in their property after the transaction date: they are entitled to stay in their home until death,[3] and have the option to move out (to go to a nursing home for instance). Unlike a reverse mortgage, the decision to move out does not necessarily end the contract: *viager* contracts typically stipulate that sellers may leave their properties in exchange for a higher annuity. A *viager* transaction is closely related to a life annuity as well. The annuity received by the *viager* seller is the analog of the annuity payment received by an annuitant. Both are calculated on the basis of the invested capital. In a life annuity the capital corresponds to the premium paid by the annuitant, and in a *viager* sale it corresponds to the monetary value that remains once the down payment and the usufruct rebatement (the reduction in the market value due to the fact that sellers retain the usufruct of their property) are subtracted from the market value of the property. There is also an important difference between the *viager* market on the one hand and

the markets for annuities and reverse mortgages on the other. In the last two markets buyers are mostly individuals, and sellers are banks or insurance companies. These firms determine and propose a menu of contracts from which individual agents can then choose. In the *viager* market, however, both buyers and sellers are typically individuals. Contracts terms are not predetermined but freely chosen by buyers and sellers.

A *viager* sale can clearly be attractive for older property owners as they may stay in their own home and earn extra money for the rest of their life. The principle is also quite flexible and offers a few advantages. First, the annuity is typically indexed to a consumer price index, which guarantees sellers that they will receive a constant real income flow. As mentioned above, most contracts also include a clause stipulating that sellers may leave their property at any time in exchange for higher annuities. Finally, sellers may donate part of the down payment to their family members. Currently, the French government actively promotes *viager* transactions as a way to increase revenue at old age and reduce the dependency on the social security system. An advisory body of the French government has recently published a detailed report on the subject (see Griffon (2008)).

In spite of these advantages and the promotion of the French government, the *viager* market is, like the annuity and reverse mortgage markets, quite small. The most natural explanation for this low rate of occurrence is again the presence of asymmetric information between buyers and sellers. Many people in France associate the *viager* principle with the story of Jeanne Calment. Back in 1965, when Mrs Calment was aged 90, she sold her apartment in Arles to a 44-years old man, on contract-conditions that seemed reasonable given the value of the apartment and the life-expectancy statistics that prevailed at the time. The man turned out to be unlucky since Jeanne Calment lived a very long life.[4] He died in 1995, two years before Mrs Calment, after having paid about FFr900,000 (twice the market value) for an apartment he never lived in. Of course there are other anecdotes that tell the complete opposite story, but still the Jeanne Calment case is the one that comes to most French minds. Real estate buyers may therefore fear the presence of adverse selection in the market and this may in part explain why the method is not that popular.

The purpose of this paper is to investigate whether the market is indeed hindered by asymmetric information about the survival prospects of sellers. We do this by using notarial data on sales in Paris and its suburbs. For each transaction we observe the most important contract parameters (down payment and annuity), the market value of the property, and some characteristics of buyers and sellers. The notarial database does not, however, record what happens after the date of signature of the contracts. In particular we do not know when sellers died. Therefore, to establish whether there is asymmetric information in the market, we cannot implement the kind of test introduced by Chiappori and Salanié (2000) and Dionne et al. (2001). The idea of this test is to look at the correlation, conditionally on all observables, between the contract choice (type of automobile insurance contract in both these papers) and an ex-post measure of the agent's type (an indicator for the occurrence of an accident). There is asymmetric information if these variables are positively correlated, and symmetric information if there is no correlation. In the absence of mortality data, we do not have an ex-post measure of the seller's type, and hence we cannot apply this so-called positive-association test.

Our approach relies on the fact that we can actually estimate the seller's type. The type of the seller is a sum of weighted death probabilities. This sum can be identified via a no arbitrage condition. A *viager* is a financial asset, and our condition states that the price of this asset (the down payment) is equal to its expected returns (expected and discounted value of property minus expected and discounted

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[2] The loan can take different forms: a lump sum payment transferred to the homeowner when the contract is signed, regular payments during a predetermined period, payments that last until the borrower's death or exit of home, or a line of credit to which the borrower has access.

[3] The term *viager* comes from *viage*, which means "time of life" in old French.

[4] On February 21, 1996, she celebrated her 121st birthday, making her the oldest living person on earth according to the Guinness Book of World Records.